STAT

Sanitized Copy Approved for Release 2011/07/12 : CIA-RDP80-00809A000700240205-6

CERTAIN PROBLEMS CONNECTED WITH THE DEVELOPMENT OF CHEMICAL SCIENCE IN TADZHIKISTAN

Kommunist Tadzhikistana
Stalinabad, 20 May 1955

V. Nikitin, Director,
Institute of Chemistry,
Academy of Sciences
Tadzhik SSR

Chemists have played a significant role in the development of natural resources of the Tadzhik SSR. This has been especially true as far as the work of members of the Institute of Chemistry, Academy of Sciences Tadzhik SSR, is concerned.

Since the first day of its existence, the institute has been conducting chemical analyses vital to industries and municipal establishments, and giving technical consulting service in regard to problems in technology. For example, the soap works was producing black soap. This was due to the fact that the soap works was using by-products of butter production from creameries. The institute assisted the soap works in purifying these by-products and these efforts resulted in the production of a light-colored, high quality soap. Chemists at the institute also did work that proved of help in the operation of narrow-guage railroads by developing a formula for softening water used in locomotive boilers.

The Ministry of Local Industry was assisted in the development of a technological process for mirror making. The State Planning Institute for Water Management of the Ministry of Agriculture USSR was assisted by the Institute of Chemistry in utilizing certain local waters of the Kulyabskaya Oblast for irrigation. The institute also conducted very important work in determining the composition of gases contained in these waters, which are derived from wells.

The Ministry of Agriculture often received valuable consultations from the Institute of Chemistry, as in determining the amount of active cyanamide in calcium cyanamide used in the defoliation of cotton plants prior to the picking of cotton. A formula was developed for preparing formalin from paraldehyde. The formalin is used for the treatment of seeds before planting. Numerous other examples could be cited illustrating the manner in which the Institute of Chemistry assists various enterprises.

The fundamental concern of the Institute of Chemistry is the thorough study of the mineral resources capable of furnishing valuable chemical raw materials required for the development of a substantial chemical industry. Minerals are one of the Tadzhik SSR's most valuable assets.

The 19th Congress of the CPSU directed that industrial processes be intensified and the complex extraction of metals from ores be increased. Research is being conducted at the institute on these problems. As a result of these investigations, a method has been developed for almost complete extraction of a great number of metals from their ores.

Natural salt deposits occupy one of the first places among the diverse mineral resources of this republic. Among the union republics, the Tadzhik SSR is the richest in salt deposits. In addition to its use in food, salt is also used to prepare metallic sodium, chlorine, hydrochloric acid, bleaching lime, caustic soda, soda ash, sodium sulfide, and a number of other salts necessary for the textile, soap, leather, glass, hydrometallurgical, and other industries. The institute has been occupied with the physicochemical investigation of the salt deposits of the republic for several years.

Further development of rail and highway networks, and the construction of new electric power stations will create favorable conditions for the organization of new centers of chemical industry and the rapid industrialization of this republic in general.

Coal and petroleum are other important mineral resources of this republic. Unfortunately, the petroleum is highly viscous and has a high percentage of tar and sulfur which make its chemical investigation more difficult. Finding ways and means in which to convert the heavy, tarry fractions of the oil into light usable products is one of the objectives set forth by the 19th Congress of the CPSU. Hence, the efforts of the Institute of Chemistry have been turned in this direction.

The coal deposits of the Tadzhik SSR are important not only as fuel reserves, but also as centers for the development of a coke-chemical industry and of an industry of organic synthesis. Since coal reserves are practically unlimited, they present a source of readily available carbon to meet any demands imposed by the development of carbon chemistry.

Since the conversion of acetylene presents the best route for the transformation of coal into such complex products as drugs and dyestuffs, the Institute of Chemistry has devoted much effort to research in acetylene chemistry. The acetylene molecule is very simple in composition and possesses a high potential energy [as far as its capacity to enter into chemical reactions is concerned.] This makes it adaptable for conversion into many other organic substances such as drugs, synthetic rubber, plastics, adhesives, and dyestuffs.

Other products prepared from acetylene are acetic acid, acetone, isoprene, chloroprene, polyvinyl chloride, vinyl ethers and esters, and other compounds. These products are of great economic value, and although acetylene chemistry has been studied for 120 years, the number of new products derived from acetylene is steadily growing.

Acetylene industry thrives in areas where coal, limestone, and cheap electric power are available. The Tadzhik SSR meets all these conditions. The coking coal will be used for the manufacture of calcium carbide, which is used in large quantities in the cotton fields [after being converted into calcium cyanamide]. Calcium carbide is also used to prepare free acetylene for use in organic syntheses. This industry will be developed in Tadzhik SSR to meet demands in the Central Asiatic republics and other areas of the Soviet Union for synthetic rubber, polyvinyl resins, acetic acid, acetate rayon, and other products for which acetylene serves as the primary raw material.

The research at the Institute of Chemistry is therefore being directed along two different lines. First, studies are being carried out on the coal itself, its chemical nature, composition, coking properties, volatile products derived from it, etc. Secondly, the synthesis of new products is being investigated.

The institute has already prepared about 50 new substances which were not known hitherto and which pave the way to the synthesis of a number of new compounds. The majority of these compounds have a very complex structure, but thanks to acetylene chemistry, they can be prepared from coal. These compounds comprise many substances of value such as drugs, essential oils, etc.

The work done at the Institute of Chemistry on the synthesis of new compounds from acetylene is still theoretical in nature, but any valid theory always has practical applications.

- E N D -